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Report of an evaluation of three courses taught at the University of Iowa via closed-circuit television. Objectives of the experiment were to determine the feasibility of the methods employed, student reactions, and to evaluate the performance of students taught by different methods—discussion, lecture, and TV discussion. The information was gathered by observation, by questionnaires completed by the students, by a limited number of interviews with the students, and by objective tests.

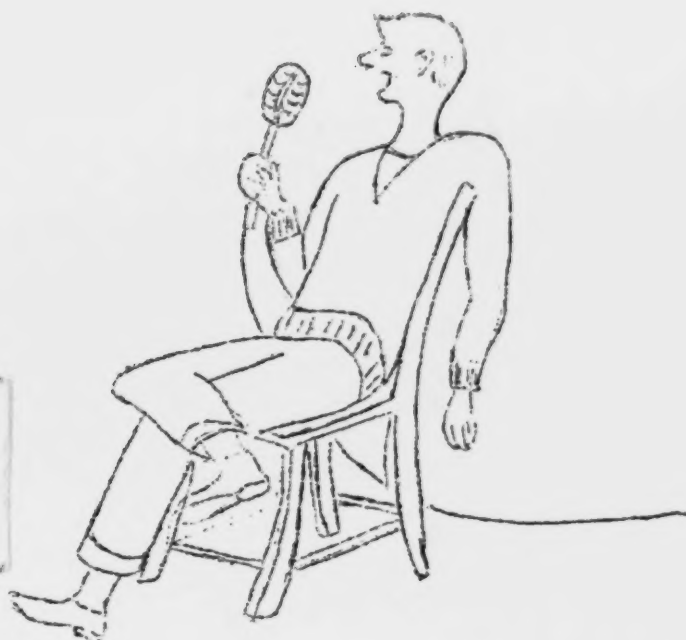
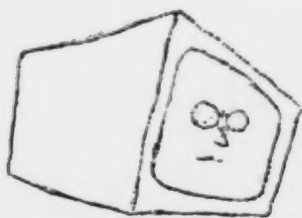
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AN EXPERIMENT IN TEACHING

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IOWA CLOSED-CIRCUIT
TELEVISION TEACHING EXPERIMENT

Summary Report

August 1956

In February, 1955, the State University of Iowa instituted a research program designed to study the application of the discussion method of teaching to large groups, utilizing the medium of closed-circuit television as a means of communication between a studio room and one or more "viewing" classrooms. While this research program was inaugurated to study a variety of problems in the field of closed circuit television, the basic questions for which answers were sought were as follows: Do students who observed (by listening to and viewing) a discussion get more or less vicariously the same sort of educational experience as do those who are physically present (and presumably participate more extensively in the discussion) in the discussion room? Do students who are taught by this method learn as well as those who are taught by more conventional methods, e.g., lecture, lecture-discussion and small group discussion methods? Three courses have now been taught by the "closed-circuit television discussion" method. This report is an attempt to summarize the experience gained and the data gathered through August 1, 1956.

The particular problem described above was selected for several reasons. First, there seems to be a dearth of information available about the effectiveness of various teaching methods on the college level. One question which often arises is whether the discussion

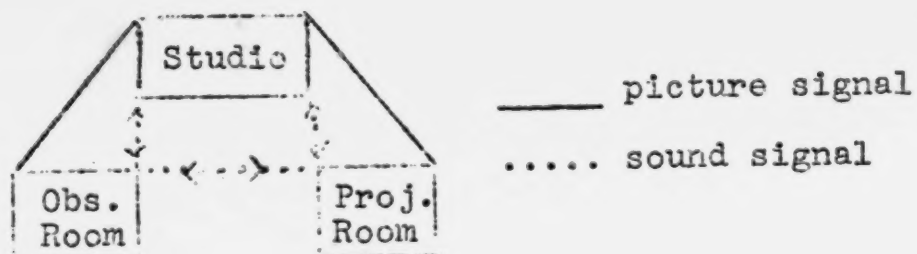
method of teaching does result in educational outcomes which are superior to other methods, e.g. lecture. Second, it is a well-known fact that no single student is able to participate very often in a classroom discussion. In other words, much of the discussion experience is actually vicarious. Therefore, does it make any difference whether this experience is gained by actual presence in the classroom or can it be obtained just as well via television? Third, in view of the rising enrollment problem it seems doubtful whether staff and facilities can be found to do a great deal of teaching by the discussion method unless some technique such as closed-circuit television can come to the rescue. [In brief, this research program was undertaken not simply to study closed-circuit television but rather to utilize television in the study of some educational problems which have confronted higher education for a considerable period of time and which appear likely to become more acute in the years immediately ahead.]

Research on closed-circuit television at the University was made possible by the already existing closed-circuit studio which had been set up in 1953 for the teaching of courses in television, for the production of educational television programs, and for research purposes. This television studio is located in the North end of the old Iowa Fieldhouse. The studio itself is 45 feet by 90 feet. It is equipped with three RCA Image Orthicon camera chains and all auxiliary electronic gear. Along with the main studio are an observation room

which holds forty-three students and projection room for television and cinematography students which holds forty-seven students, as well as the control room, telecine room, prop room and shop, rehearsal rooms and offices.

The following was decided as the physical set-up for the discussion classes on closed-circuit television. The instructor and fourteen students were in the studio, seated at a V-shaped table with the instructor at the apex before a blackboard. The remainder of the students were divided between the observation room and the projection room where they could watch those in the studio on standard 21 inch television sets and could enter into the discussion by means of microphones passed to them by the proctor in each room.

Block diagram of closed circuit



As the diagram indicates, all groups could hear each other but only the studio group could be seen. When a student in one of the viewing groups wanted to enter the discussion or ask a question he raised his hand whereupon the proctor in that room pressed a switch which he held in his hand. This activated one of the two small lights on the instructor's table in the studio, indicating from which viewing room

a student wanted to talk. When the instructor was ready for the comment he would ask for it. The proctor would announce the student's name and pass him the mike. Students were periodically rotated between the studio and the two viewing rooms. These shifts generally coincided with the completion of a unit of course work.

Two cameras were used to pick up pictures of the studio group, four microphones to pick up the sound. A single microphone on a long cord was used in each of the viewing rooms to pick up the sound from these locations. It was passed by the proctor to the person who wished to speak. For one course, Electro-Voice Differential microphones were used in the viewing rooms. This type was used so that they could be kept "open" at all times. They are designed in such a way that no "feedback" will result from keeping them "open" because general sound coming at the microphone from different directions is self-cancelling and only sound directed straight into the face of the microphone from an extremely close range will be transmitted. Thus, the instructor could interrupt a student speaking from a viewing room or could intersperse comments. He could also hear a certain amount of general reaction from these rooms. The studio group heard the sound from the viewing rooms through speakers on the back walls of the studio set. The speaker for each of the viewing rooms was in a different location so that the studio group and the instructor could tell the source of the sound. Each viewing group heard the other through the sound from these speakers being picked up by the studio microphones and thus transmitted. An apparently insurmountable prob-

lem arose from the use of these close-talk microphones. [Students in the viewing rooms, untrained in the use of microphones and intent upon the discussion, were often careless about speaking directly into the microphone. Thus, sound quality was often quite low. This appeared to be so distracting that a different type of microphone, the Electro-Voice 600-D, was employed in each viewing room for the second two courses taught in the experiment. This was a more sensitive microphone with which correct usage was not as critical. Because of this fact, the microphones could not be kept "open". Each microphone contained a button which the student depressed when he wished to speak. This cut the speaker in that particular viewing room so that there would be no "feedback". Sound quality was thus improved. The disadvantage of this was that the instructor could no longer interrupt a student in the viewing room so long as the student held the button down on his microphone, nor could the instructor hear reactions from the viewing rooms while he was speaking since, naturally, no one would be holding the mike buttons down.]

The results of any course, whether on or off television, are obviously dependent in large part upon the instructor. The results of this type of study undoubtedly have some relationship to the course content also. These factors have been taken into consideration in the present study only insofar as three different instructors and three different courses were utilized. The first course taught in this way in the study was Comparative Foreign Governments taught by H. E. Kelso, Assoc. Prof. of Political Science. The second was

American Government taught by James N. Murray, Jr., Asst. Prof. of Political Science. The third class was Greeks and the Bible taught by Clark Griffith, Asst. Prof. of English. There were some differences in the arrangements for each class which should be kept in mind when evaluating the results.

Comparative Foreign Governments is a three-hour Political Science course which met twice a week for 75-minute periods. There were 87 students in the course, almost equally divided among freshmen, sophomores, juniors and seniors. Somewhat over half of these were political science majors.

American Government is also a three-hour Political Science course which met three times a week for 50-minute periods. This course is elected by many students in Liberal Arts and is obviously of interest to students of Political Science. There were 68 students in the class, primarily freshmen and sophomores, a few less juniors, and even fewer seniors.

Greeks and the Bible is one of three literature courses, of which any two must be elected by undergraduates to fulfill the literature requirement in the Liberal Arts College. It is designed primarily for sophomores, although there are a small number of freshmen, juniors and even seniors who take it. There were 47 students in the section which was held on TV. This class was handled differently than the other two televised courses. It is a four-hour course, meeting four times weekly for 50-minute periods. The two Political Science courses had all class meeting on TV except for the periods

when examinations were being taken. The Literature course utilized closed-circuit television for only half of its meetings, those on Wednesday and Friday. The Tuesday and Thursday sessions were held with all of the students in a single, conventional classroom.

The general objectives of the research on closed-circuit television at Iowa were described in the opening paragraph of this paper. The specific purposes of the early experimentation were: 1) to see whether a discussion carried on under these conditions with a fairly large number of students was feasible -- or even possible, 2) to examine the reactions of students to learning under these conditions, and 3) to compare the performance of students taught by different methods -- discussion, lecture, and TV discussion. There was much subsidiary information gained which will also be described.

Information was gathered by observation of the courses, questionnaires completed by the students in the course, a limited number of interviews with these students, and objective tests concerned with information acquisition. During the Comparative Foreign Governments course a tabulation of all student participation was made over a sample period comprising approximately one-third of the semester. Students filled out preliminary questionnaires less than three weeks after the class started so that a record could be obtained of their early reaction to this method of instruction. They completed more detailed questionnaires during the last formal meeting of the class. The American Government class completed questionnaires approximately two-thirds of the way through the semester. During the remainder of

the semester, 32 of the students in the class were interviewed in order to probe more deeply into their responses. A second section of American Government, taught in the conventional "interrupted lecture" method by another instructor was used as a "control". These students responded to many of the same questions which the television group had answered so that some attempt could be made to separate responses which could be attributed to the course from those appearing to be associated with the particular method of teaching. Performance of the television group, as measured by the two mid-term examinations of the course, was compared to the performance of two classes taught the following semester by the television instructor, Mr. Murray. One of the latter classes, with 112 students, was taught by the conventional lecture method. The second, with 17 students, was taught by the discussion method in a regular classroom. The Greeks and the Bible class completed questionnaires during the last week of school. Another section of the same course taught by the same instructor also filled out a shortened form of the questionnaire for the same reason cited above for American Government.

RESULTS

I. STUDENT REACTIONS

Though the respondents in each class were not always asked identical questions, wherever possible reactions will be grouped by subject matter rather than course.

How do the televised courses compare, with respect to interest, to other courses that these students have taken?

- a) The American Government students were asked "How do you compare this course to others you are taking?"

	<u>Television</u>	<u>Non-Television</u>
Much more interesting	20.6%*	7.7%
More interesting	48.5	51.9
As interesting	19.1	30.8
Less interesting	8.8	7.7
Much less interesting	2.9	1.9

Better than half of the students interviewed who felt that the television course was more interesting or much more interesting than other courses they were taking, said that television was a factor in this additional interest. Almost as many felt that discussion also added to the interest. Of those who felt the television course was less or much less interesting, discussion seemed to be a greater factor than television in lessening interest.

- b) Those students in the Comparative Foreign Governments class and the Greeks and the Bible class who had been in other courses taught wholly or partly by the discussion method were asked how this televised course compared with other courses with respect to quality.

	<u>Comp Foreign</u>	<u>Greeks &</u>
	<u>Govt</u>	<u>Bible</u>
This (TV) course is much better	2.5%	15.2%
This course is better than most	35.0	39.1
About the same	35.0	17.4
This course is not as good as most	25.0	28.3
This course is much worse	0.0	0.0
No response	2.5	

* The responses will not always total 100% because of the rounding off to one decimal place.

In the Greeks and the Bible class, the students who felt the closed-circuit class was much better or better than most were asked what it was that made this course better. Sixty-four per cent said that "television" was at least one of the factors. An additional eight per cent said that it was the variety caused by the combination of closed-circuit television and regular classroom meetings. Of those students who felt the closed-circuit course was not as good as most courses taught by the discussion method, twenty-three per cent felt this was because of television. An additional thirty-eight and a half per cent felt that the closed-circuit course was good for those on the panel but bad for those in the viewing rooms.

How do students feel about the effect of television on their learning?

- a) The Comparative Foreign Governments students were asked where they felt they learned more facts. The responses broke down in this way:

In Comparable lecture courses	45.1%
In this course	22.5
About the same	32.4

- b) The Greeks and the Bible students were asked whether they felt they learned more facts when the class was meeting over TV or when it was taught by the regular discussion method in a classroom. These responses were:

On TV	19.6%
In regular classroom	19.6
About the same	56.5
More on panel, less in viewing rooms	2.2
No response	2.2

- c) The American Government television class was simply asked "Do you think you would learn more if this class were taught by discussion in a classroom?"

Yes	36.8%
No	58.8
No response	4.4

- d) The Comparative Foreign Governments class was asked where they felt they were stimulated to greater thought. These were the responses:

In regular lecture course	32.4%
In this course on TV	45.1
About the same	22.5

- e) The Greeks and the Bible class was asked on which days they felt they were stimulated to greater thought. Their responses were similar to those for the Governments class.

When the class is meeting in a regular classroom	30.4%
When the class is meeting on TV	37.0
About the same	30.4
More on panel, less in viewing rooms	2.2

- f) The American Government students were also asked whether they felt that the presentation of the course over television was affecting the amount they were learning.

Increasing learning considerably	2.9%
Increasing learning	19.1
Does not affect learning	43.8
Reducing learning	22.1
Reducing learning considerably	4.4

Seven of the students who felt that this presentation of the course was increasing their learning were interviewed. Four said it was due to television making it more interesting and thus holding their attention better; three said it was the discussion element that increased learning. Five students who thought this presentation adversely affected learning were also interviewed. Only two made comments which were in any way related to television; one said that he became so fascinated by television that it distracted him from learning and the other said that he couldn't single out any single factor but that the separation of the class into different groups might be one of the factors.

- g) The non-television section of American Government was asked "Do you think the amount you learn would be different if this course were taught on a closed-circuit TV system? The responses broke down in this way:

Learn much more	0.0%
Learn more	13.5
Learn about the same	36.5
Learn less	38.5
Learn much less	9.6
No response	1.9

The far greater negative response from these students who had not experienced this method of teaching would seem to indicate that the experience of being in a class which utilizes closed-circuit television influences students to be more favorable to this use of the medium.

Should closed-circuit television be used for this course or other comparable courses in the future?

- a) The Comparative Foreign Governments class was asked "If Comparative Foreign Governments was being offered next year in a number of different ways and a friend of yours wanted to take it, which of the following would you advise him to take?"

Section taught by straight lecture in a regular classroom	28.9%
Section taught by the discussion method in a regular classroom	18.3
Section taught by straight lecture on television	7.0
Section taught as this one was (discussion on TV)	41.6
Makes no difference	4.2

Among those students who had had other courses taught wholly or partly by the discussion method, a greater proportion selected the fourth response.

- b) The Greeks and the Bible classes were asked somewhat different questions. The TV section was asked, "If you were to take another core course next year, which of the following plans would you prefer?"

Section taught by straight lecture in a regular classroom	
Section taught by the discussion method in a regular classroom	2.2%
Section taught by straight lecture on TV	52.2
Section taught as this one was (combination TV disc. and regular classroom)	0.0
Makes no difference	41.3
	4.4

The Greeks and the Bible sections which did not meet on television were asked, "If Greeks and the Bible was being offered next year in a number of different ways and a

friend of yours wanted to take it, which of the following would you advise him to take?"

Section taught by straight lecture in a regular classroom	9.3%
Section as this one was (Discussion in a regular classroom)	68.5
Section taught by straight lecture on TV	1.9
Section taught by the discussion method on closed-circuit TV	16.7
Makes no difference	3.7

This would appear to be further evidence that being in a course which is taught on closed-circuit television tends to make the student more favorable toward the use of this medium for instruction.

- c) The Greeks and the Bible class which met on TV part of the time was also asked "If you were to take another course similar to this one, would you prefer to have it:

All on TV, as this course was on Wednesday and Friday	4.4%
All in a regular classroom, as this course was on Tuesday and Thursday	41.3
A combination of 2 and 2, such as was in effect this semester	54.3

When asked why they checked the preferences they did, these were the responses:

Of those who wanted the class all on TV (2 students), one thought it more interesting and the other felt that it gave the student the "atmosphere" of a small group.

Of those who preferred the class to be held completely in a classroom, a number were bothered by the mechanics of the television discussion either because it slowed down the discussion or because it made them nervous. A feeling of isolation in the viewing rooms bothered some students. They felt the classroom atmosphere to be more "stimulating". A number also felt that a good instructor was more important in television than in the regular

classroom and some felt that the classroom provided a more permissive situation for discussion and questions.

Among those who liked the two and two idea, "variety" was the principal reason given. A large number of students felt that the television sessions and the classroom sessions each served a different and important function. They felt that the television sessions stimulated interest for the lectures and accompanying acquisition of facts in the classroom. Television gave them a chance to participate as though they were in a small class while the classroom, they said, gave the instructor a chance to summarize, clarify, or bring up other pertinent data. A few students felt television to be a good experience for speaking before an audience. Two students felt some classroom meetings were good for overcoming the "lost" feeling -- for getting to know classmates better.

Does the fact that a course is being taught by the discussion method on closed-circuit television cause the students to prepare better for each class meeting?

- a) The Comparative Foreign Governments class was asked "Do you feel that it is necessary to do more preparation for this course than for comparable lecture courses you are taking or less?"

More for comparable lecture courses	5.6%
More for this course	57.8
About the same	35.2
No response	1.4

- b) Both the television and the non-television sections of American Government were asked "In comparison to other courses you are taking, how much time do you spend in preparation for each meeting of this course?"

	<u>TV Section</u>	<u>Non-TV Section</u>
Much more time	0.0%	1.9%
More time	22.1	7.7
About the same time	63.7	50.0
Less time	10.3	30.8
Much less time	2.9	9.6

The course being televised in this way appeared to cause those students in the TV section to study more on the average than their peers in the non-TV section. From the information gathered in interviews with many of these students, the fact that the TV-section was taught by the discussion method seemed to be a greater factor in motivating study than did the fact that the course was utilizing television. Television's only influence here appeared to be that there was slightly more motivation to study when a student was in the studio group than when he was in one of the viewing rooms.

- c) A similar question asked of these two American Government classes was "Before coming to a class meeting, how often do you read the material assigned for that meeting?" These were the responses of each group:

	<u>TV Section</u>	<u>Non-TV Section</u>
Always read	58.8%	21.1%
Frequently read	33.8	50.8
Seldom read	7.3	21.8
Never read	0.0	5.6

This question, coming later in the questionnaire, simply reinforced the information discovered on the earlier question.

- d) Both the TV and non-TV sections of Greeks and the Bible were also asked "Do you feel that it is necessary to do more preparation for this course than for comparable courses you are taking or less?"

	<u>TV Section</u>	<u>Non-TV Section</u>
More for this course	19.6%	22.2%
About the same	69.6	70.4
Less for this course	10.9	7.4

The results with these classes seemed to reverse the results for the two political science courses. In this case, the differences are slightly in favor of the non-TV sections. This can probably be explained by the fact that both the TV and non-TV sections of Greeks and the Bible were taught by the discussion method primarily. This would appear to be a further indication that discussion, not television, is the factor that accounts for the greater pre-class preparation of the students in the television sections of Comparative Foreign Governments and American Government.

In a class taught by the discussion method, does the use of closed-circuit television encourage or inhibit participation? If television is to be successful in "enlarging" a discussion class, it must not only make it possible for a greater number of students to participate, but it must somehow create a situation which encourages or motivates such participation. To find out whether it did, a number of questions were asked and observations made.

- a) The Greeks and the Bible class, which met half of the time on TV and the remainder in a regular classroom, was asked, "Do you find it easier to participate in the discussion when this class is meeting on TV or when it is meeting in a regular classroom?"

It is easier to participate when it meets on TV	30.4%
It is easier when it meets in the regular classroom	65.2
It makes no difference	4.4

There was very little agreement among those who found it easier to participate on television as to why this was so.

The fact that the class was broken into small groups -- especially if one wound up on the panel -- seemed to be important. Some students felt that the television meetings were more informal or permissive which aided discussion. Two students also felt that there was less irrelevant discussion on television; one attributed this to the delay caused by microphones being passed and the other to a certain reluctance on the part of students.

There was somewhat more agreement among those who found it easier to participate when the class met in a regular classroom. The physical separation of class members in the television class was felt to be bad, especially for those in the viewing groups because they received less recognition than those in the studio group. The mechanical elements bothered quite a number of students, primarily because of the complexity of entering the discussion from the viewing rooms. (Raising one's hand, being recognized by the proctor, then being recognized by the instructor in the studio, and then having the microphone passed) Four students claimed a greater feeling of personal contact in the classroom, although another student claimed the same thing for television. A number also indicated a certain amount of stage fright caused by the microphones and cameras.

- b) The television section of American Government was asked
"In comparison to other courses you are taking, do you feel

self-conscious here (in TV) when making a comment?"

Much more self-conscious	5.9%
More self-conscious	35.3
No difference	47.1
Less self-conscious	10.3
Much less self-conscious	1.5

The most important reason for a greater amount of self-consciousness seemed to be the feeling that the student was speaking to "millions of people" or a "ghost audience" as two students expressed it. Some students were more afraid of making mistakes on television. The primary reason for less self-consciousness in the television situation appeared to be the fact that the students were broken into smaller groups and did not feel that they were speaking to a large class. It is interesting to note the completely opposite feeling about the class structure arrived at by different students in the same class.

- c) It was apparent from earlier interviews and questionnaires that some students felt that the group in the studio had some advantages over those in the viewing rooms insofar as participation in the discussion was concerned. For this reason, the American Government students in the television section were asked, "Do you feel that any particular group has an advantage in participating in class discussion".

The responses were:

Studio group	30.9%
Projection room	4.4
Observation room	4.4
All are equal	60.3

Ten of the students who felt that the studio group had an advantage were interviewed on this point. Eight said it was because they were in the same room with the instructor. The other two said it was easier for the studio group because they get "first chance to participate". Two of the first eight mentioned this also. Only one of the students who cited the projection room and two who cited the observation room were interviewed. The former said that the proctor in the projection room paid more attention to those with questions than did the proctor in the observation room. Of the latter two students, one said there were more people in the projection room so he felt his chance for participation was better in the projection room. The other said the darkness of the projection room was not conducive to discussion. (This room had low level, indirect, fluorescent lighting to enable students to see the television screen more clearly.)

Actually, in the American Government and Comparative Foreign Governments classes, where this question was studied, it appeared that there was approximately an equal amount of participation from each of the three groups. The much smaller number of students in the studio group though meant that each of these students averaged a greater amount of participation. Another type of tabulation which showed the proportion of students participating each day was made in the Comparative Foreign Governments class. Over thirty-

two per cent of the students in the class actually participated, on the average, each day. The "participation advantage" of students in the studio could be seen when this was broken down by groups:

Observation room	28.2%
Projection room	25.3
Studio	57.9

There were almost three times as many students in each of the viewing groups as there were in the studio group so there were actually a greater number of students participating on the average day from each of these rooms than there were from the studio, even though the proportions were smaller. These figures on the proportion of students participating seem greater when the fact is considered that a great many students participated more than once each day.

A further indication of the stimulation of students created by this type of teaching is the fact that there were many more students wanting to participate than there was time for. The average number of times per day that students raised their hands to participate and were not called upon was 36.2. The breakdown by groups was:

Observation group	5.7 times
Projection group	5.6
Studio group	24.9

This would appear to be further evidence of the greater stimulation of the students in the studio with the instructor as compared to the stimulation of those students in the viewing groups.

How did the electronic equipment necessary in closed-circuit classes of this type affect the students?

- a) The American Government students were asked "When communicating from the observation and projection rooms, how does having to talk into a microphone affect you?"

Helps me think much better	4.4%
Helps me think better	2.9
Does not affect me	32.4
Causes me to become a little flustered	51.5
Causes me to become very flustered	8.8

Principal criticisms of the microphone were having to hold it while speaking and "mike fright". A number of students noted that although they were bothered by using the microphones in the viewing rooms (where they had to hold them) they were not bothered by the microphones in the studio (where they simply sat on the tables). Some students also complained about having to pass the microphones in the viewing rooms.

- b) The American Government students who had been in the studio group at some time were also asked "When seated in the studio does the movement of the cameras and technical personnel bother you?"

Bothers very much	5.1%
Bothers some	25.6
Does not bother	69.2

Those who checked one of the first two responses were then asked, "Do you feel that it (the distraction) is sufficient to reduce your chances to learn in this course?"

Reduces learning very much	16.7%*
Reduces learning much	0.0
Reduces learning some	50.0
Does not affect learning	33.3

Of those students interviewed who had been bothered by the movements of cameras and technical personnel, half indicated that they became accustomed to it after being in the studio group for a while. The other half indicated that they were disturbed if a camera moved in for a close shot of them. Most of those who said they were not bothered also indicated, in the interviews, that they had been bothered at first but had become accustomed to it.

- c) A somewhat similar question to the above, asked of the American Government students who had been on the panel, was "How do you feel about having the camera 'on' you when you are making a comment?"

Helps me in thinking much more clearly	0.0%
Helps me in thinking more clearly	10.5
Does not affect me	61.5
Makes me become confused in my thinking	23.1
Makes me become very confused in my thinking	5.1

These students were also asked, "Do you avoid participation in the discussion because you know the camera will focus on you?"

Endeavor to participate much more	0.0%
Endeavor to participate more	12.8
Does not affect me	61.5
Endeavor to avoid participation	15.4
Endeavor to avoid participation completely	7.7
No response	2.6

(* These percentages are based only on those students who had checked one of the first two responses on the preceding question.)

Is it possible to achieve student-instructor "rapport" in a closed-circuit television class?

There is a great deal of speculation on this point. The instructor of the Comparative Foreign Governments class felt that it was achieved very well. He noted the

"very close sense of communication achieved between members of the outside sections (those in the viewing rooms) and the person 'on screen' from the studio. Students in the two outside groups talked directly to the individual pictured on the television set in their room -- even to the extent of using gestures and facial expressions as though actually confronted with their discussant. Many times an expression of the person 'on camera' would cause a student to falter or revise a statement about his point of view." He then went on to say that "This feeling of belonging appears to have been one of the unique characteristics generated through the use of the 'talk-back' audio circuits".

Twenty-four American Government students were interviewed to determine whether they felt the same "rapport" indicated by this instructor. These students were asked if they felt "left out" or "far away" when they were in the viewing rooms and if this feeling of remoteness was lesser or greater in classes of similar size taught in the conventional manner.

Feel as close or closer in this situation	66.7%
Feel closer in a regular classroom	33.3

Two students said that they felt closer after they had been in the studio group and yet the same breakdown of responses was obtained from those students who had never been on the panel as from those who had. Typical of the comments by those who felt as close or closer in this situation were "Maybe this seems closer because the instructor seems to be talking to the

individual" and "The class seems smaller than it actually is." Typical of the comments from those who felt more remote in the television situation were "Television is putting something between me and the instructor" and "I feel away from the whole thing, so that my mind seems to wander while I'm in the viewing rooms."

The students in the Comparative Foreign Governments class and the Greeks and the Bible class were asked "If this course is offered on TV again next year, what suggestions do you have that you believe would improve it?"

- a) The Comparative Foreign Governments students appeared to worry most about ways for the important points and facts to be better emphasized. They felt that ways must be found to keep the discussion from wandering off on tangents and that a greater proportion of time should be devoted to lecturing by the instructor. A number of students also thought that more rotation of the studio group would improve participation.
- b) The Greeks and the Bible students seemed more concerned about the students in the viewing rooms, as well as about improving the discussion. The greatest single suggestion was that ways be found to make it easier for those in the viewing rooms to participate. Similarly, there were suggestions that the importance of the studio group be reduced and the instructor concentrate more on the viewing

groups and that more ways be found to stimulate these viewing groups. Some students worried about viewing group motivation in another way: they suggested that the panel be changed more often to give more students an opportunity to be on it. There were varied suggestions for improving the discussion. Most cited was that the size of the class be reduced or, as one suggested, periods be made longer. A few suggested that the discussion be "channeled" more. A number of students indicated the importance of students in a class "getting to know each other better". Whether this was to be as an aid to discussion was not clear. The only other suggestion made by a sizable number of respondents was that "guest stars" be eliminated. In this class, some additional instructors were brought in to take over the class on certain days. The students apparently preferred to have the same instructor each day.

II. RESULTS AS MEASURED BY PERFORMANCE IN TESTS

It will be remembered that in the American Government course, students were taught by three methods: (1) discussion over closed-circuit TV, (2) lecture method, and (3) small discussion group. The question in this phase of the research was: How is performance affected by the method of presentation? Performance, in this case, was defined as the score made on the first two multiple-choice examinations in the first semester of the course. The scores of the students in the television section were compared to the scores

made the following semester by students in a normal lecture section and students in a small, conventional discussion section. All of the experimental classes were taught by the same instructor.

In order to carry out this experiment it was necessary to assume that the classes formed for the first and second semester presentations did not differ initially on any variables relevant to performance as defined. It was impossible to utilize strictly random sampling procedures so the results must be interpreted with this restriction in mind. The basic results were as follows:

Group	No. of* Cases	Class means		
		1st Ach. Exam	2nd Ach. Exam	Entrance Comp.
Television	66	34.12	41.62	54.11
Lecture	112	33.76	42.58	52.82
Discussion	17	33.53	40.59	50.25

*Only cases having complete records on the two achievement examinations and the University entrance examinations were retained for the analysis.

The rather obvious similarity in the mean scores on all variables for the three groups was substantiated by the results of a simple analysis of variance of the three variables; all F-tests were insignificant with the F ratios in each case being less than unity. In view of the small between-groups variance found for these three analyses, a covariance analysis using entrance composite as a control variable was not considered necessary. These results in general are consistent with the hypothesis that student performance, as defined, is not differentially affected by these

methods of instruction as conducted in the American Government course. Furthermore, the assignment of subjects to the treatment groups can be considered fairly satisfactory since the mean values for the three groups on the entrance composite did not differ significantly and the variances of the entrance composite ranks were homogeneous.

Correlations among the three variables utilized in the current study were also examined. Correlations of the entrance composite with both achievement examinations were found to be nearly as high as the correlation between the two achievement examinations. One could argue from this that all three measures can be interpreted in terms of a single hypothesized variable defined as the general academic skill and interest of the students. In terms of this hypothesis, levels of student performance in American Government can be said to be associated more closely with differences between individual students in academic skills than with differences between the three methods of instruction studied.

SUMMARY

There is little educational experimentation done in actual teaching situations which is as controlled as one might wish. The experimentation described in this report was no exception. In spite of this, the results clearly show that teaching by the discussion method on closed-circuit television with this number of students is possible. None of the teachers appeared to have difficulty in adapting to the situation. After a short period of time, it

appeared to be simply another class for each one. Only one seemed to feel that the situation was restricting or "cramping his style". He felt that he wasn't able to move about the classroom as much as he liked.

Though the possibility of this type of teaching has been established, the practicability and desirability are another matter. These must be determined on the basis of the individual case and on the data which further research must provide. The State University of Iowa hopes to supply some of this data as a result of its continued investigation of this problem during the 1956-57 academic year. Some of the questions it hopes to answer are:

- 1) Will a discussion class with 60 to 90 students, taught on closed-circuit television, be as effective as:
 - a) A discussion class of 60 to 90 students taught in a conventional classroom?
 - b) Discussion classes of 20 to 25 students taught in conventional classrooms?
 - c) A lecture class with 60 to 90 students or more?
- 2) Will a viewing group which can only see and hear the discussion gain as much as the viewing groups which can participate in the discussion through the 2-way audio system?